

- (vii) Normal and abnormal procedures;
- (viii) Emergency procedures; and
- (ix) Postflight procedures.
- (2) *A type rating for an airplane—multiengine course:* (i) Preflight preparation;
 - (ii) Preflight procedures;
 - (iii) Takeoff and departure phase;
 - (iv) In-flight maneuvers;
 - (v) Instrument procedures;
 - (vi) Landings and approaches to landings;
 - (vii) Normal and abnormal procedures;
 - (viii) Emergency procedures; and
 - (ix) Postflight procedures.
- (3) *A type rating for a powered-lift course:* (i) Preflight preparation;
 - (ii) Preflight procedures;
 - (iii) Takeoff and departure phase;
 - (iv) In-flight maneuvers;
 - (v) Instrument procedures;
 - (vi) Landings and approaches to landings;
 - (vii) Normal and abnormal procedures;
 - (viii) Emergency procedures; and
 - (ix) Postflight procedures.
- (4) *A type rating for a rotorcraft—helicopter course:* (i) Preflight preparation;
 - (ii) Preflight procedures;
 - (iii) Takeoff and departure phase;
 - (iv) In-flight maneuvers;
 - (v) Instrument procedures;
 - (vi) Landings and approaches to landings;
 - (vii) Normal and abnormal procedures;
 - (viii) Emergency procedures; and
 - (ix) Postflight procedures.
- (5) *Other aircraft type ratings specified by the Administrator through aircraft type certificate procedures:* (i) Preflight preparation;
 - (ii) Preflight procedures;
 - (iii) Takeoff and departure phase;
 - (iv) In-flight maneuvers;
 - (v) Instrument procedures;
 - (vi) Landings and approaches to landings;
 - (vii) Normal and abnormal procedures;
 - (viii) Emergency procedures; and
 - (ix) Postflight procedures.

5. *Stage checks and end-of-course tests.* (a) Each student enrolled in an aircraft type rating course must satisfactorily accomplish the stage checks and end-of-course tests, in accordance with the school's approved training course, consisting of the approved areas of operation that are appropriate to the aircraft type rating for which the course applies at the airline transport pilot certificate level; and

(b) Each student must demonstrate satisfactory proficiency prior to receiving an endorsement to operate an aircraft in solo flight.

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APPENDIX K TO PART 141—SPECIAL PREPARATION COURSES

1. *Applicability.* This appendix prescribes the minimum curriculum for the special

preparation courses that are listed in §141.11 of this part.

2. *Eligibility for enrollment.* Prior to enrolling in the flight portion of a special preparation course, a person must hold a pilot certificate, flight instructor certificate, or ground instructor certificate that is appropriate for the exercise of the operating privileges or authorizations sought.

3. *General requirements.* (a) To be approved, a special preparation course must:

(1) Meet the appropriate requirements of this appendix; and

(2) Prepare the graduate with the necessary skills, competency, and proficiency to exercise safely the privileges of the certificate, rating, or authorization for which the course is established.

(b) An approved special preparation course must include ground and flight training on the operating privileges or authorization sought, for developing competency, proficiency, resourcefulness, self-confidence, and self-reliance in the student.

4. *Use of flight simulators or flight training devices.* (a) The approved special preparation course may include training in a flight simulator or flight training device, provided it is representative of the aircraft for which the course is approved, meets requirements of this paragraph, and the training is given by an authorized instructor.

(b) Training in a flight simulator that meets the requirements of §141.41(a) of this part, may be credited for a maximum of 10 percent of the total flight training hour requirements of the approved course, or of this section, whichever is less.

(c) Training in a flight training device that meets the requirements of §141.41(b) of this part, may be credited for a maximum of 5 percent of the total flight training hour requirements of the approved course, or of this section, whichever is less.

(d) Training in the flight simulators or flight training devices described in paragraphs (b) and (c) of this section, if used in combination, may be credited for a maximum of 10 percent of the total flight training hour requirements of the approved course, or of this section, whichever is less. However, credit for training in a flight training device that meets the requirements of §141.41(b) cannot exceed the limitation provided for in paragraph (c) of this section.

5. *Stage check and end-of-course tests.* Each person enrolled in a special preparation course must satisfactorily accomplish the stage checks and end-of-course tests, in accordance with the school's approved training course, consisting of the approved areas of operation that are appropriate to the operating privileges or authorization sought, and for which the course applies.

6. *Agricultural aircraft operations course.* An approved special preparation course for pilots in agricultural aircraft operations must include at least the following—

- (a) 25 hours of training on:
 - (1) Agricultural aircraft operations;
 - (2) Safe piloting and operating practices and procedures for handling, dispensing, and disposing agricultural and industrial chemicals, including operating in and around congested areas; and
 - (3) Applicable provisions of part 137 of this chapter.

(b) 15 hours of flight training on agricultural aircraft operations.

7. *Rotorcraft external-load operations course.* An approved special preparation course for pilots of external-load operations must include at least the following—

- (a) 10 hours of training on:
 - (1) Rotorcraft external-load operations;
 - (2) Safe piloting and operating practices and procedures for external-load operations, including operating in and around congested areas; and
 - (3) Applicable provisions of part 133 of this chapter.

(b) 15 hours of flight training on external-load operations.

8. *Test pilot course.* An approved special preparation course for pilots in test pilot duties must include at least the following—

- (a) Aeronautical knowledge training on:
 - (1) Performing aircraft maintenance, quality assurance, and certification test flight operations;
 - (2) Safe piloting and operating practices and procedures for performing aircraft maintenance, quality assurance, and certification test flight operations;
 - (3) Applicable parts of this chapter that pertain to aircraft maintenance, quality assurance, and certification tests; and
 - (4) Test pilot duties and responsibilities.
- (b) 15 hours of flight training on test pilot duties and responsibilities.

9. *Special operations course.* An approved special preparation course for pilots in special operations that are mission-specific for certain aircraft must include at least the following—

- (a) Aeronautical knowledge training on:
 - (1) Performing that special flight operation;
 - (2) Safe piloting operating practices and procedures for performing that special flight operation;
 - (3) Applicable parts of this chapter that pertain to that special flight operation; and
 - (4) Pilot in command duties and responsibilities for performing that special flight operation.
- (b) Flight training:
 - (1) On that special flight operation; and
 - (2) To develop skills, competency, proficiency, resourcefulness, self-confidence, and self-reliance in the student for per-

forming that special flight operation in a safe manner.

10. *Pilot refresher course.* An approved special preparation pilot refresher course for a pilot certificate, aircraft category and class rating, or an instrument rating must include at least the following—

(a) 4 hours of aeronautical knowledge training on:

- (1) The aeronautical knowledge areas that are applicable to the level of pilot certificate, aircraft category and class rating, or instrument rating, as appropriate, that pertain to that course;
- (2) Safe piloting operating practices and procedures; and

(3) Applicable provisions of parts 61 and 91 of this chapter for pilots.

(b) 6 hours of flight training on the approved areas of operation that are applicable to the level of pilot certificate, aircraft category and class rating, or instrument rating, as appropriate, for performing pilot-in-command duties and responsibilities.

11. *Flight instructor refresher course.* An approved special preparation flight instructor refresher course must include at least a combined total of 16 hours of aeronautical knowledge training, flight training, or any combination of ground and flight training on the following—

- (a) Aeronautical knowledge training on:
 - (1) The aeronautical knowledge areas of part 61 of this chapter that apply to student, recreational, private, and commercial pilot certificates and instrument ratings;
 - (2) The aeronautical knowledge areas of part 61 of this chapter that apply to flight instructor certificates;
 - (3) Safe piloting operating practices and procedures, including airport operations and operating in the National Airspace System; and
 - (4) Applicable provisions of parts 61 and 91 of this chapter that apply to pilots and flight instructors.
- (b) Flight training to review:
 - (1) The approved areas of operations applicable to student, recreational, private, and commercial pilot certificates and instrument ratings; and
 - (2) The skills, competency, and proficiency for performing flight instructor duties and responsibilities.

12. *Ground instructor refresher course.* An approved special preparation ground instructor refresher course must include at least 16 hours of aeronautical knowledge training on:

- (a) The aeronautical knowledge areas of part 61 of this chapter that apply to student, recreational, private, and commercial pilots and instrument rated pilots;
- (b) The aeronautical knowledge areas of part 61 of this chapter that apply to ground instructors;
- (c) Safe piloting operating practices and procedures, including airport operations and

operating in the National Airspace System; and

(d) Applicable provisions of parts 61 and 91 of this chapter that apply to pilots and ground instructors.

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APPENDIX L TO PART 141—PILOT GROUND SCHOOL COURSE

1. *Applicability.* This appendix prescribes the minimum curriculum for a pilot ground school course required under this part.

2. *General requirements.* An approved course of training for a pilot ground school must include training on the aeronautical knowledge areas that are:

(a) Needed to safely exercise the privileges of the certificate, rating, or authority for which the course is established; and

(b) Conducted to develop competency, proficiency, resourcefulness, self-confidence, and self-reliance in each student.

3. *Aeronautical knowledge training requirements.* Each approved pilot ground school course must include:

(a) The aeronautical knowledge training that is appropriate to the aircraft rating and pilot certificate level for which the course applies; and

(b) An adequate number of total aeronautical knowledge training hours appropriate to the aircraft rating and pilot certificate level for which the course applies.

4. *Stage checks and end-of-course tests.* Each person enrolled in a pilot ground school course must satisfactorily accomplish the stage checks and end-of-course tests, in accordance with the school's approved training course, consisting of the approved areas of operation that are appropriate to the operating privileges or authorization that graduation from the course will permit and for which the course applies.

APPENDIX M TO PART 141—COMBINED PRIVATE PILOT CERTIFICATION AND INSTRUMENT RATING COURSE

1. *Applicability.* This appendix prescribes the minimum curriculum for a combined private pilot certification and instrument rating course required under this part, for the following ratings:

(a) Airplane.

(1) Airplane single-engine.

(2) Airplane multiengine.

(b) Rotorcraft helicopter.

(c) Powered-lift.

2. *Eligibility for enrollment.* A person must hold a sport pilot, recreational, or student pilot certificate prior to enrolling in the flight portion of a combined private pilot certification and instrument rating course.

3. *Aeronautical knowledge training.*

(a) Each approved course must include at least 65 hours of ground training on the aeronautical knowledge areas listed in paragraph (b) of this section that are appropriate to the aircraft category and class rating of the course:

(b) Ground training must include the following aeronautical knowledge areas:

(1) Applicable Federal Aviation Regulations for private pilot privileges, limitations, flight operations, and instrument flight rules (IFR) flight operations.

(2) Accident reporting requirements of the National Transportation Safety Board.

(3) Applicable subjects of the "Aeronautical Information Manual" and the appropriate FAA advisory circulars.

(4) Aeronautical charts for visual flight rules (VFR) navigation using pilotage, dead reckoning, and navigation systems.

(5) Radio communication procedures.

(6) Recognition of critical weather situations from the ground and in flight, windshear avoidance, and the procurement and use of aeronautical weather reports and forecasts.

(7) Safe and efficient operation of aircraft under instrument flight rules and conditions.

(8) Collision avoidance and recognition and avoidance of wake turbulence.

(9) Effects of density altitude on takeoff and climb performance.

(10) Weight and balance computations.

(11) Principles of aerodynamics, powerplants, and aircraft systems.

(12) If the course of training is for an airplane category, stall awareness, spin entry, spins, and spin recovery techniques.

(13) Air traffic control system and procedures for instrument flight operations.

(14) IFR navigation and approaches by use of navigation systems.

(15) Use of IFR en route and instrument approach procedure charts.

(16) Aeronautical decision making and judgment.

(17) Preflight action that includes—

(i) How to obtain information on runway lengths at airports of intended use, data on takeoff and landing distances, weather reports and forecasts, and fuel requirements.

(ii) How to plan for alternatives if the planned flight cannot be completed or delays are encountered.

(iii) Procurement and use of aviation weather reports and forecasts, and the elements of forecasting weather trends on the basis of that information and personal observation of weather conditions.

4. *Flight training.*

(a) Each approved course must include at least 70 hours of training, as described in section 4 and section 5 of this appendix, on the approved areas of operation listed in paragraph (d) of section 4 of this appendix that are appropriate to the aircraft category and class rating of the course: